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SOME OBSERVATIONS AND NOTES ON MUSCULIUM.

BY V. STERKI.

Most or all of our species of *Musculium* Link (*Calyculina* Clessin) are very variable. *E. g.*, of *M. securis* Pr. there are almost endless forms, some of them so different from others that they appear to be distinct species, even of different groups. They readily respond to the nature of their habitats, and almost every place has its own peculiar forms. It may be added that most of them are inhabitants of quiet waters: small lakes, ponds, pools, marshes, ditches, slow streams; but *M. transversum* Say is also found in rivers with strong current, with stony and rocky bottoms.

Years ago Clessin stated his belief that they are comparatively short-lived and of cyclical development, annuals. The first part of his statement is probably correct, the latter probably not, or not for all species; specimens at all stages of growth, from newly hatched to full-grown, can be found at any time of the year. Yet under certain conditions their development appears to be uniform; *e. g.*, where pools dry up in fall, only the young mussels appear to survive, to grow to maturity and propagate during spring and summer.

These mussels are described as having their beaks calyculate, or "capped," and the genus has been established mainly on that feature.[1] But in most and probably in all species, specimens and forms are found with slightly or non-calyculate beaks, and such are the rule

[1] Yet even without that supposed but mistaken character the genus appears to be well founded, as will be shown elsewhere.

rather than the exception in *M. transversum* Say. By the way, it may be said that calyculate beaks are found occasionally in specimens of *Pisidium* and *Sphærium*.

The nepionic (embryonic) mussel when discharged from the parent is generally well inflated (except in *M. transversum*), and then the postembryonal part of each valve is marked off from it by a constriction more or less deep. This seems to be especially well marked when the embryos have been retained by the parent for a long time, *e. g.*, over winter, and are overgrown, as it were.[1] Under favorable conditions the embryos are probably discharged as soon as sufficiently developed, moderately inflated, and then postembryonal growth goes on in the same direction without or with a slight demarcation line.

There are in my collection a number of lots of a *Musculium*, different from all other species described and known, from Rhode Island, Virginia, Ohio, Michigan, and remarkably alike. The mussels are somewhat like medium-sized *M. securis* Pr., but more elongate, moderately and evenly inflated; the anterior and posterior parts are less disproportionate, the latter is less high, less and more obliquely truncate, the beaks are not calyculate, rounded, comparatively broad and not very prominent; even under the microscope, no demarcation line between the embryonal and postembryonal parts can be seen; the surface is markedly regular, without or with slight lines of growth, with very fine striæ and a slight silky gloss; the color is dark horn, not yellowish, somewhat lighter along the margins, but there are no sharply defined zones, as common in *securis*. Isolated, this *Musculium* would appear to represent a distinct species; but younger specimens, evidently of the same form, have more the outlines of *M. securis*, and in every lot there are some specimens of the same, with the beaks calyculate, and generally there are intermediate ones, as to outlines and general appearance. Several of the lots were collected in fall, from September to November, and others probably so. It appears probable that this is a summer form of *M. securis*, of fast and steady growth under favorable conditions, consequently not a variety. Corresponding forms of other species have also been seen. If verified by future observations, this is a remarkable and very interesting fact.

Also the varieties and local forms of all species, and the conditions

[1] Under the microscope such specimens show several concentric zones along the margins of the valves, marked by lines of growth.

under which they grow, should be carefully studied. In order to do this much more good material is needed from all over the continent. It is very desirable to collect repeatedly, throughout the year, at favorable places, wherever there is an opportunity for doing so; it is essential to have the date of collecting with every lot, notes on the nature of the habitat, and last but not least, to have good numbers of specimens, not only the large ones, but also the half-grown and young. Any material, from anywhere, will mean a contribution to our knowledge.

It may be added that the simplest and best means for collecting small fresh-water mollusca, Sphæriidæ and gastropods, is a sack net of good burlap on a frame of strong wire ($\frac{1}{5}$–$\frac{1}{4}$ inch), the ring of about 6–8 inches diam., tied to a handle of suitable length, *e. g.*, a broomstick. In this net mud and other material, scooped up from the surface of the bottom, is washed, the coarser things gradually removed; the remainder is taken home and dried well, but not in too great heat. Then, a small sieve, *e. g.*, a strainer, or several of different mesh measures, are very serviceable for separating finer and coarser material, and it will be much easier to pick out the specimens, of which the smallest should not be overlooked; some *Pisidium* are not larger than 1 to 2 mm. when mature. Specimens to be sent for examination are best left mixed up, or separated only for considerable differences of size. The washings and specimens must be handled carefully, especially *Musculium*, since most of them are very fragile. The whole "stuff," dirt and all, fresh or dried, may be sent for examination, after the coarser materials are removed.

For deep water a drag-net or small dredge of burlap will do good service, especially if protected by an outer sack of strong canvas with the bottom left open. It is very desirable that collecting be done in lakes and deep rivers.

DESCRIPTION OF A NEW FOSSIL LYMNÆA.

BY F. C. BAKER.

LYMNÆA NASHOTAHENSIS n. sp.

Shell elongated, somewhat pyramidal; surface dull, growth-lines conspicuous, crossed by fine, impressed spiral lines; whorls 6–6½, rather rapidly increasing in diameter, flatly rounded, the body whorl very large and quite convex or even gibbous; spire broadly pyramidal or conic, longer than the aperture; sutures well marked; aperture